State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES
6 Hazen Drive, P.O. Box 95, Concord, NH 03302-0095
(603) 271-3406 FAX (603) 271-7894

April 15, 2002
Letter of Deficiency
DAM #155.01

Mr. Rusty Mclear
Hampshire Hospitality Holdings Inc.
312 Daniel Webster Highway
Meredith, NH 03253

RE: Lake Waukewan Dam, Meredith

Dear Mr. Mclear:

The Department of Environmental Services, Dam Bureau (DES) consistently strives to enhance the safety of dams in New Hampshire through its dam safety program. One of the many instruments that plays a part in reaching this goal is our inspection program. DES is forwarding this correspondence to you to advise you that in accordance with RSA 482:12 and Env-Wr 502.02, an inspection of the subject dam was conducted on . During this visual inspection and/or file review, the following deficiencies were observed:

Items noted during the file review:

1. The NHDES received a letter from HEB Civil Engineers in December of 1994 indicating that they were retained by Meredith Bay Corporation to conduct an investigation, study, and report as requested by the DES in a letter dated November 1994. The letter from HEB indicated that there were no plans for the penstock, dam or control structures and they were going to research and determine the configuration of the dam and outlet works. The DES has no documentation on file of any further work conducted by HEB Engineering. In addition, there are no detailed design or as-built plans on file with the NHDES;

2. On March 24, 1981, a dewatered inspection of the outlet conduit from Waukewan Lake was conducted by a State of New Hampshire Staff Engineer. This inspection was attended by a representative of NCM Consultants and Mr. Clifford Hodges, the dam owner's representative at that time. The inspection result indicates that the conduit is made up of a 6 foot by 6 foot by 125 foot long concrete culvert beginning at the trash rack running under Main Street where on the East side of the street it changes to a 6 foot diameter steel penstock. This penstock runs approximately 188 feet to a gatehouse where the outlet is a 6 foot diameter concrete conduit which terminates at a surge tower 70 feet from the gate house.

   In 1981, the concrete box section was judged to be in good condition showing little or no deterioration. Construction joints were tight with the exception of the transition from the concrete box to the steel penstock showing minor dripping. The steel penstock condition was judged as fair to poor. Extensive rusting prevailed along the entire section with at least one small (3 inch x 3 inch) breakthrough area located at a point on the crown of the pipe. The outer lying material at this breakthrough was firm but could easily be removed with the use of a small hammer. It did not appear that there was a concrete casing around this penstock but rather the penstock was merely buried using local fill. There was a 50 foot +/- section located below

Amatex's parking lot and also an adjacent driveway that had apparently yielded to stresses and had deformed. The deformation amounted to a depression of the upper 1/3 of the pipe of about 4 inches to 6 inches but no fractures of the steel were noticed. The concrete pipe conduit from the gatehouse to the surge tower was in good condition. Several of the joints of the 8-foot sections of this pipe were in need of resealing.

As a result of this inspection, repairs to the steel penstock were completed in 1983. The repairs included a 3 inch reinforced Gunite lining of the steel portion of the penstock. The only evidence that these repairs were conducted is a letter from Amatex, the dam owner at the time, with attached invoices of work completed by Gunite and Grouting Corporation. No construction photographs or as-built plans were submitted confirming that work has been done. No additional dewatered inspections or diving inspections, as far as DES knows, have been completed since the 1981 inspection;

Items noted during the scheduled inspection:

3. There is still flow from the two pipes located beneath the patio/restaurant located downstream and to the left of the old penstock outlet and flume channel;

4. There are voids and leakage under the stone wall at the downstream left end of the flume. There also appears to be sediment build up at the location where the flow exits from under the wall indicating possible piping of the material below the flume channel floor;

5. There are several voids in the flume channel floor with flow observed entering these voids. These voids are the possible source of flow exiting from under the stone wall as indicated above in item number 4;

6. There is seepage evident at the contact of the two stone walls located at the contact of the left hand side flume wall and the old outlet to the penstock;

   There is missing concrete at both the left and right ends of the stop logs at the surge tower allowing flow around the stop logs;

8 There is minor leakage under the stoplogs;

9. There is eroded concrete and a diagonal crack approximately ¼ wide on the downstream left face of the stoplog structure located approximately 6 feet below the stoplogs;

10. There is a vertical crack in the corner of the concrete stoplog bay discharge channel to the right of the stoplog structure;

    There is leakage through boards blocking the old 6-foot penstock outlet located on the downstream face of the surge tower structure. It appears that this leakage is seeping into the ground just downstream of the penstock pipe;

.2. There is missing concrete and seepage exiting the corner of the stoplog structure adjacent to the left downstream corner of the structure adjacent to the discharge channel;

13. The stoplog structure appears to have been coated with gunite at some point in the past for aesthetic purposes. The surface is cracked and is its integrity is unknown;

14. There is no operation and maintenance plan on file with the DES; and

15. The emergency action plan (EAP) has not been updated or tested.

DES is requesting that a plan and schedule, with the assistance of a licensed professional engineer, be developed by July 1, 2002 that calls for the following items to be corrected by October 1, 2003:

1. Research and report on the progress of the investigation and report that HEB Engineering began preparing in 1994;

2. Submit a set of plans for this dam. If none exist, as-built plans should be drawn and stamped by a Professional Engineer Licensed in the State of New Hampshire. At a minimum the plans should include sizes, inverts, and a profile of the outlet works including the abandoned penstock;

3. Retain a Civil Engineer licensed in the State of New Hampshire to conduct and document a dewatered inspection of the conduit between the lake and surge tower. The inspection should pay particular attention to the condition of the transition of the concrete box culvert to the Gunite lined steel penstock as well as the concrete conduit joints from the gatehouse to the stoplog bay tower. It is recommended for safety concerns that no traffic be allowed to travel over the conduit while the dewatered inspection is conducted. This inspection should be coordinated with the NHDES Dam Bureau;

4. Investigate and report on the operability of the gate located along the length of the conduit;

5. Investigate and report the origin of flow exiting the two pipes located beneath the patio of the restaurant located above the old penstock outlet;

6. Investigate and determine the source of flow exiting under the stone wall at the downstream left end of the flume. Also determine if there is soil being transported out from under the wall and repair as necessary;

7. Repair the voids in the channel floor of the flume. This should include the investigation and repair of any voids that may exist below the sluiceway's floor and adjacent fill material;

8. Investigate and determine the source of seepage exiting the stone wall located between the old penstock outlet and the flume;

9. Repair the missing concrete at both the left and right ends of the stop log bays;

10. Repair the eroded concrete and crack on the downstream left face of the stoplog structure located approximately 6 feet below the stoplogs;

Repair the vertical crack in the corner of the concrete stoplog bay discharge channel to the right of the stoplogs;

12. Repair the leakage through the boards blocking the old 6-foot penstock outlet located on the downstream face of the stoplog structure;

13. Repair the missing concrete located the downstream left side of the stoplog structure adjacent to the discharge channel;

14. Investigate and report on the integrity of the Gunite surface of the stoplog structure;

15. Review and update the EAP as necessary, then conduct a test of the emergency notification flowchart. Notify DES of the results; and

16. Prepare and submit to DES a written operational procedure plan. The plan should describe the control of impoundment levels, monitoring and maintenance procedures, and identify emergency contact personnel.

DES is requesting that you complete and submit the attached "Intent to Complete Repairs" form, within 30 days of receipt of this letter, that will provide for correction of the identified deficiencies by the date(s) indicated above. If you believe changes to the items of work or dates are necessary, please make the changes directly on the form and provide a brief explanation. We have enclosed a self addressed stamped envelope for you to return this form.

Our intent in sending you this correspondence is to make you aware of items that DES believes warrant your attention to insure the continued safe operation of your dam. It is our hope that, through the submittal of the attached form and a commitment to keeping a well-maintained dam, you will voluntarily comply with the requested items of work. If we do not receive the intent form or a similarly adequate written reply, we will assume that you are in agreement with our findings and recommendations and DES will carry out follow-up inspections accordingly.

If you have any questions or comments regarding this Letter of Deficiency or would like to be present at future inspections, please contact me at 271-3406, or write to the Water Division at the address listed on the top of the previous page.

Sincerely,

Jeffrey M. Blaney
Dam Safety Engineer

Attachments Guideline for an O&M plan, DB13
cc: Gretchen Rule
Town of Meredith
Certified # 7099 3400 0002 9773 6378
JMB/was/h:/safety/wendy/lod/155-01lod.doc